Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) A method for measuring an inter-diffusion coefficient in electrically conductive melts, comprising the steps of:

joining together two electrically conductive solid materials with their respective different compositions in parallel with a gravity direction thereof,

heating and melting said electrically conductive solid materials under static magnetic field orthogonal to said gravity direction to form two electrically conductive melts with their respective different compositions therefrom,

maintaining said electrically conductive melts for a predetermined period of time under said static magnetic field,

cooling and solidifying said conductive melts, and

measuring an inter-diffusion coefficient between said conductive solid materials after cooling and solidifying said conductive melts.

2. (Original) The measuring method as defined in claim 1, wherein a ratio (w/h) is set to 1/5 or below if a height and a width of each conductive melt is set to "h" and "w", respectively.

3. (Original) The measuring method as defined in claim 1, wherein said conductive melts are maintained in a non-conductive vessel.

4. (Original) The measuring method as defined in claim 3, wherein said non-conductive vessel is made from graphite.

5. (Original) The measuring method as defined in claim 1, wherein a strength of said static magnetic field is set to 1T or over.

6. (Original) The measuring method as defined in claim 1, wherein said conductive melts are cooled at a rate of 20°C/minute or over.

7. (Original) The measuring method as defined in claim 1, wherein at least one of said conductive melts is an In-Sn melt.

8. (Currently Amended) An apparatus for measuring inter-diffusion coefficient in electrically conductive melts, comprising:

heater for heating and melting two electrically conductive solid materials with their respective different compositions which are joined along a gravity direction thereof, to form two electrically conductive melts with their respective different compositions,

holder for maintaining said electrically conductive melts, ~~and~~

magnetic field-applying means for applying static magnetic field to said electrically conductive melts in a direction orthogonal to said gravity direction, and

measuring means for measuring an inter-diffusion coefficient between said conductive solid materials after cooling and solidifying said conductive melts, the inter-diffusion coefficient being a measure of mutual diffusion of said conductive melts into each other.

9. (Original) The measuring apparatus as defined in claim 8, wherein a ratio (w/h) is set to 1/5 or below if a height and a width of each conductive melt is set to "h" and "w", respectively.

10. (Original) The measuring apparatus as defined in claim 8, wherein said holder is made from a non-conductive vessel.

11. (Original) The measuring apparatus as defined in claim 10, wherein said non-conductive vessel is made from graphite.

12. (Original) The measuring apparatus as defined in claim 8, wherein a strength of said static magnetic field is set to 1T or over.

13. (Original) The measuring apparatus as defined in claim 12, wherein said magnetic field-applying means is constructed of a superconducting magnet.

14. (Original) The measuring apparatus as defined in claim 8, wherein at least one of said conductive melts is an In-Sn melt.

15. (Previously Presented) The measuring method as defined in claim 1, wherein said inter-diffusion coefficient is calculated according to an equation $L=(Dt)^{1/2}$, wherein L is the diffusion length, D is the inter-diffusion coefficient and t is the diffusion time.

16. (Previously Presented) The measuring apparatus as defined in claim 8, wherein said inter-diffusion coefficient is calculated according to an equation $L=(Dt)^{1/2}$, wherein L is the diffusion length, D is the inter-diffusion coefficient and t is the diffusion time.

17. (New) A method for measuring an inter-diffusion coefficient in electrically conductive melts, comprising the steps of:

joining together two electrically conductive solid materials with their respective different compositions in parallel with a gravity direction thereof,

heating and melting said electrically conductive solid materials under static magnetic field orthogonal to said gravity direction to form two electrically conductive melts with their respective different compositions therefrom,

maintaining said electrically conductive melts for a predetermined period of time under said static magnetic field,

cooling and solidifying said conductive melts, and

measuring an inter-diffusion coefficient between said conductive solid materials by determining a degree of mutual diffusion of said conductive melts into each other after cooling and solidifying said conductive melts.